12th March 1958]

TABLE III.—*Effect of mesh size on the rate of reduction.*

Rate of flow of Hydrogen = 1,000 c.c. per minute.

Temporature of reduction = 900°C.

Total time of reduction = 70 minutes.

Mesh size.	Per cent reduction.
1 Lump ore	53·08
2—10 mesh	62·0
3—32+72	77·6
4—100	55·1

It is observed that the reducibility has a maximum value for —32 + 72 mesh sample and that—100 mesh sample has poor reducibility. Table IV indicates the effect of temperature on the reducibility of—32 + 72 mesh samples.

TABLE IV.—*Effect of temperature on the rate of reduction.*

Mesh size—32+72, rate of flow of hydrogen 1,000 c.c. per minute.
Total time of reduction 70 minutes.

Temperature° C.	Per cent reduction.
1 600	48·5
2 800	59·8
3 900	77·6
4 1000	69·5

It is observed that a maximum reduction 77·6 per cent is obtainedd at 900°C. and the total reduction decreased at 1000 C.

It is clearly seen that the optimum mesh size, temperature and gas velocity and all of them have the effect of increasing the rate of reduction in the initial period of 20 minutes of reduction only and thereafter no appreciable difference is observed. This may be due to the high silica content of the ore which might combine with iron to form fayalite and making the further reduction a very slow process. Further experiments are being carried out to confirm these findings.

With these preliminary data on unconcentrated samples, the test results at different stages of concentration will be compared and the improvement in the reducibility of this ore will be observed.

A preliminary experiment conducted at 800°C. and 1,000 c.c. per minute hydrogen gas velocity with the concentrated ore of—32 mesh size analysing 65 per cent Fe and 8·5 per cent Sio 2 showed a percentage reduction of 71·99 per cent for 70 minutes and 84·14 per cent after 120 minutes respectively.